

4.6 GEOLOGY, SOILS, FAULTS, AND MINERAL RESOURCES

The following section addresses the existing onshore and offshore geology, soils, faults, and mineral resources within the study area. For this analysis, the study area includes the Irish Hills, Los Osos Valley, and the continental shelf extending offshore from the proposed landing site. Potential effects of construction and operation of the proposed Project and alternatives on geologic resources are identified below. Mitigation measures are included to reduce significant impacts to geologic resources.

4.6.1 Environmental Setting

Onshore

Region and Site Onshore Geology

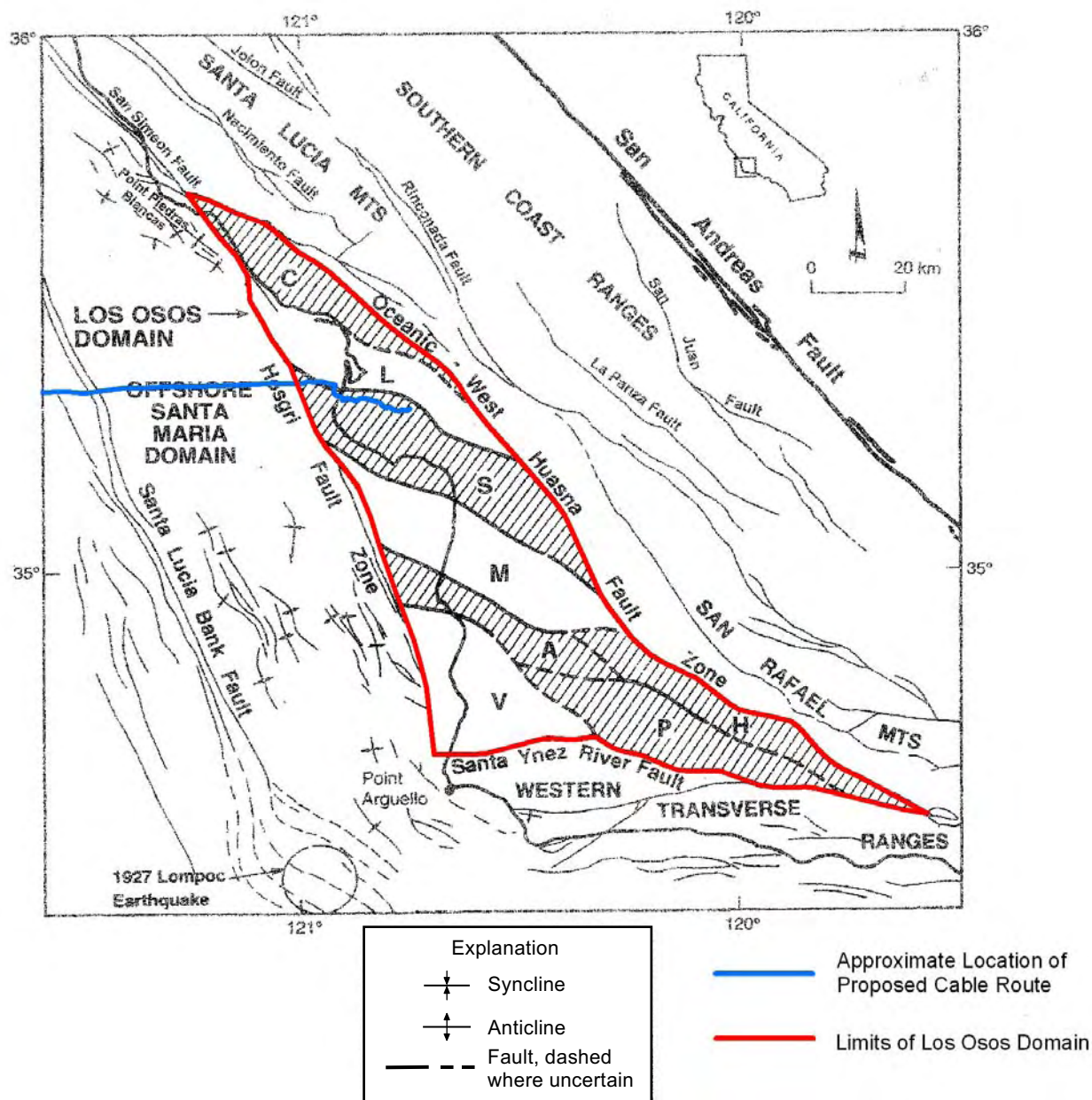
The proposed onshore cable route will extend from the existing San Luis Obispo Cable Station, near San Luis Obispo, California west through Montaña de Oro State Park. The San Luis Obispo/Morro Bay area is in the southern portion of the Coast Ranges Geomorphic Province, which is characterized by northwest-trending mountains and valleys composed of Mesozoic and Cenozoic marine and terrestrial sedimentary deposits underlain by Franciscan formation metamorphic rocks and/or granitic rocks of the Salinian Block. The Coast Ranges Geomorphic Province is bounded by the offshore Santa Maria Basin to the west (Figure 4.6-1).

Faults in this Province and in the offshore Santa Maria Basin region trend to the northwest, subparallel to the San Andreas Fault. The San Andreas Fault is the center of a broad, heterogeneous zone of right-lateral, strike-slip faulting (with small amounts of dip-slip in some areas) that arises from relative motion between the Pacific and North American Plates (Lettis *et al.* 2004). Several of these faults are present offshore and are crossed by the proposed cable alignment (Figure 4.6-2).

The onshore portion of the proposed cable route begins at a manhole within the Sandspit Beach parking lot in Montaña de Oro State Park. The onshore segment of proposed cable route is a 100 foot (ft)- (31 meter [m]) wide corridor that extends 10.5 miles (16.9 kilometers [km]) to the San Luis Obispo Cable Station, from the Sandspit Beach parking lot and Montaña de Oro State park boundary along Pecho Valley Road and Los Osos Valley Road to the Cable Station.

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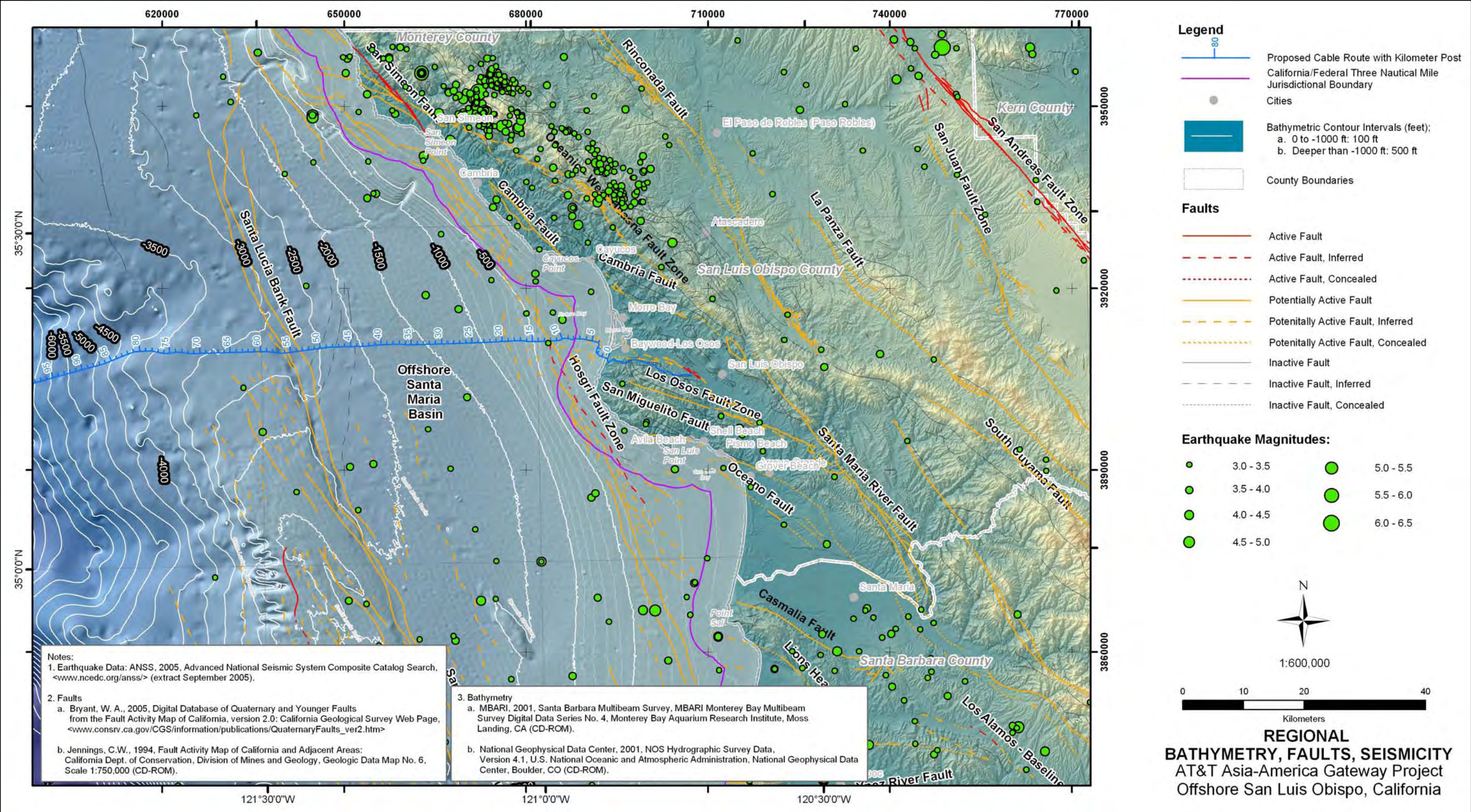
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Map of study area showing major kinematic domains including the Los Osos Domain, offshore Santa Maria Basin domain, Southern Coast Ranges domain, and western Transverse Ranges domain. The Los Osos domain is divided into distinct structural blocks, including C-Cambria, L-Los Osos Valley, S-San Luis/Pismo, M-Santa Maria Valley, A-Casmalia, H-Solomon Hills, V-Vandenberg/Lompoc, P-Purisima. Hatched areas show location of Quaternary uplift within the Los Osos domain.

SOURCE: Lettis et al., 2004

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Source Fugro 2008

REGIONAL BATHYMETRY, FAULTS, SEISMICITY
FIGURE 4.6-2

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The section of the proposed cable route between the mean high tide line and Sandspit Road parking lot is located along moderately steep to steep slopes in soft dune sands that are susceptible to shallow slope failures and erosion. However, the proposed cable will be installed in the existing overland conduit system, avoiding this potential hazard.

The proposed onshore cable route has also been determined to cross no significant geologic hazards such as landslides or other slope instabilities; however, the main strand of the Los Osos fault trends approximately east-west within an 1,800 foot- (549 m) wide zone located just north of the cable landing site, and the northwesterly-trending Strand B of this fault near the intersection of Los Osos Valley Road and Bush Street. The main strand of the fault was determined to be “active” under state standards by consultants to Pacific Gas and Electric (PG&E) (Lettis and Hall 1990) as part of the Long Term Seismic Program for the Diablo Canyon nuclear generating facility (PG&E 1988). Based on the vertical offset of the Cayucos marine terrace (120,000 years old), the return period for an earthquake capable of significant (1.7 ft [0.5 m]) surface displacement is about 2,000 years. The last time of movement is unknown.

Offshore

Region and Site Marine Geology

The onset of glaciation during the Pleistocene Epoch caused several major oscillations in the sea level of more than 300 ft (91 m), as the polar ice caps formed and subsequently receded. The last major regression occurred about 17,000 years ago, and global sea levels dropped approximately 400 ft (122 m) (Fillon *et al.* 2004). Thus, sediments on the seafloor of the present-day continental shelf were exposed for several thousand years. Migrating rivers eroded sizeable channels when sea level regressions exposed portions of the present seafloor. Sediments on the inner continental shelf in the Morro Bay area are consistent with recent deposition under turbulent, shallow water conditions. Sediments farther offshore consist of silty clays that settled out of suspension.

The marine portion of the proposed cable route begins at the Sandspit Beach parking lot in Montaña de Oro State Park (Kilometer Post [KP] 0), and proceeds offshore to the west (Figures 4.6-2, -3a, and -3b). The target burial depth for the cable is 3.3 ft (1.0 meter) for water depths up to 6,000 ft (1,830 meters). Thus, existing conditions are described along the proposed cable route to the 6,000-foot (1,830 m) isobath, which occurs at approximately KP 95. Geologic conditions are described using the Project

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